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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,215	03/23/2004	Yong-jin Ahn	1293.1278C6	1661

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WASHINGTON, DC 20005

EXAMINER
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CHOW, LIXI

ART UNIT	PAPER NUMBER
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2627

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/11/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/806,215

Applicant(s)

AHN ET AL.

Examiner

Lixi Chow

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3, 6, 7, 9, 10 and 12-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6, 7, 9, 10 and 12-22 is/are rejected.
- 7) ☒ Claim(s) 3, 6 and 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Claims 1-3, 6, 7, 9, 10 and 12-22 are pending in this application.

#### *Double Patenting*

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-3, 6, 7, 9, 10 and 12-22 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of copending application No. 10/806107. Claims 1 and 2 correspond to claims 1 and 2 of copending application; claim 3 corresponds to claim 5 of the copending application; claims 6, 9, 10, 12, 13 correspond to claim 9 of the copending application; claim 7 corresponds to claim 8 of the copending application; claims 14-18 correspond to claim 12-18 of the copending application; claims 19 and 21 corresponds to claim 19 of the copending application; and claims 20 and 22 correspond to claim 20 of the copending application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

#### *Claim Rejections - 35 USC § 112*

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 18 and 22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Specifically, claim 18 recites, “wherein the high power level of the period is a power level of a last pulse of the multi-pulse of the erase pattern”; however, applicants’ disclosure only supports the feature of claim 18 when the power level of the leading pulse of the erase pattern is a high power level of the multi-pulse. Claim 18 depend from claim 1, and claim 1 recites that power level of the leading pulse of the erase pattern is a low power level. Hence, applicants fail to provide written description of the recording waveform, wherein the leading pulse of the erase pattern is at a low power level of the multi-pulse, and the high power level of the period is a power level of a last pulse of the multi-pulse of the erase pattern.

Furthermore, claim 22 recites, “wherein the low power level of the period is other than a power level of a last pulse of the multi-pulse of the erase pattern”; however, applicants’ disclosure shows that in the case when the leading pulse of the erase pattern is set at a low power level, the power level of the period is equal to the power level of a last pulse of the erase pattern. Hence, applicants fail to provide written description or figures of the recording waveform, wherein the leading pulse of the erase pattern is at a low power level of the multi-pulse, and the low power level of the period is other than a power level of a last pulse of the erase pattern.

*Claim Rejections - 35 USC § 102*

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 19 and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Ichihara (US 6,396,792).

Regarding claim 19:

Ichihara discloses an information storage medium which stores data recorded using a waveform, comprising:

a first state corresponding to a recording pattern of the waveform (see Fig. 1A, first state is when the waveform is a high state); and

a second state corresponding to an erase pattern of the waveform (see Fig. 1A, second state is when the waveform is at a low state), wherein:

the erase pattern comprises a multi-pulse having a power level of a leading pulse of the erase pattern at a high power level of the multi-pulse (see Fig. 1B, power level of the leading pulse of the erase pattern is at Pc1) and a power level of a period between an end point of the erase pattern and a start point of the leading pulse of a recording pattern at the high power level of the multi-pulse (see Fig. 1B and col. 6, line 62 to col. 7, line 1; the example provided by Ichihara, i.e., the level may be changed from Pc1 to Pa, suggests that the power level of a period between an end point of the erase pattern and a start point of the leading pulse of a recording

pattern is at high power level), and the recording pattern and the erase pattern are concatenated by a cooling pulse of the waveform (see Fig. 1B).

Regarding claim 21:

Ichihara discloses the information storage medium of claim 19, wherein the high power level of the period is other than a power level of a last pulse of the multi-pulse of the erase pattern (see Fig. 1B and col. 6, line 62 to col. 7, line 1).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 2, 9, 10 and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno et al. (US 5,150,351; hereafter Ohno) in view of Ichihara (US 6,396,792).

Regarding claims 1 and 16:

Ohno discloses an information storage medium which stores data recorded using a waveform, comprising:

a first state corresponding to a recording pattern of the waveform (see Fig. 4(a), first state is when the waveform is a high state); and

a second state corresponding to an erase pattern of the waveform (see Fig. 4(a), second state is when the waveform is a low state), wherein:

the erase pattern comprises a multi-pulse having with a power level of a leading pulse of the erase pattern set at a low power level of the multi-pulse (see Fig. 4(a) and 4(b); power  $P_r$  is the low power level of the multi-pulse), and

an end point of the recording pattern and a start point of the erase pattern are concatenated by a cooling pulse of the waveform (see Fig. 4(b)).

Ohno fails to disclose the power level of a period between the end point of the erase pattern and a start point of a leading pulse of the recording pattern is set at a high power level of the multi-pulse. However, Ichihara discloses an information storage medium which store data recorded using a waveform, comprising:

an erase pattern and a recording pattern, wherein the erase pattern includes a leading pulse and a multi-pulse having corresponding high and low power levels, and a power level of a period between an end point of the erase pattern and a start point of a leading pulse of the recording pattern is a high power level of the multi-pulse (see Fig. 1B and col. 6, line 62 to col. 7, line 1; the example provided by Ichihara, i.e., the level may be changed from  $P_{c1}$  to  $P_a$ , suggests that the power level of a period between an end point of the erase pattern and a start point of the recording pattern is the high power level of the multi-pulse); wherein the high power level of the period is other than a power level of a last pulse of the multi-pulse of the erase pattern (see Fig. 1B).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the information storage medium of Ohno, so that the power level of a period between an end of the erase pattern and the start of the recording pattern is the high power level of the multi-pulse as suggested by Ichihara. One of ordinary skill in the art would have

been motivated to do this because having a high power level of the multi-pulse between the end of the erase pattern and the start of the recording pattern will ensure the entire area in the width direction of the recording track uniformly passes the temperature zone promoting generation of crystal nuclei (see col. 7, lines 1-5).

Regarding claim 2:

Ohno discloses the information storage medium, wherein:

the first state is a mark formed by a first level of an NRZI data signal, and the second state is a space formed by a second level of the NRZI data signal (see Fig. 4(a) and Fig. 4(b)).

Regarding claims 9 and 10:

Ohno discloses the information storage medium, wherein the recording pattern comprises another multi-pulse, and a first one of the another multi-pulses of the recording pattern after the period has a power that is other/greater than the low power level of the leading pulse of the erase pattern (see Fig. 4(b)).

Regarding claim 12:

Ohno discloses the information storage medium, wherein the power of the first one of the another multi-pulses of the recording pattern is greater than the high power level of the erase pattern (see Fig. 4(b)).

Regarding claim 13:

Ohno does not, but Ichihara discloses the information storage medium, wherein the power of the leading pulse of the another multi-pulse of the recording pattern is greater than the power of the period between the end point of the erase pattern and the start point of the leading pulse of the another multi-pulse of the recording pattern (see Fig. 1B).



Refer to claim 1 for a reason of one skilled in the art would have been motivated to combine the teaching of Ohno and Ichihara.

Regarding claims 14 and 15:

Ohno discloses the information storage medium, wherein the another multi-pulse of the recording pattern further comprises a recording pulse having a recording power greater than the high power level of the erase pattern (see Fig. 4(b), the power level  $P_p$  is greater than power level  $P_b$ , which is the high power level of the erase pattern).

10. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno in view of Ichihara as applied to claim 1, and further in view of Clark et al. (US 5,802,031; hereafter Clark).

Regarding claim 7:

Ohno and Ichihara do not disclose the data recorded using the waveform modulated according to a Run Length Limited (RLL) (1,7). However, Clark discloses the recording of data using the waveform modulated according to a Run Length Limited (RLL) (1,7) (see Clark, col. 6, lines 51-59).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have adopted the method of recording data according to a Run Length Limited (RLL) (1,7) in the medium of Ohno as taught by Clark. One of ordinary skill in the art would have been motivated to do this, because recording of marks and spaces of length  $2T$  to  $8T$  for standard M-O recording system is possible (see Clark, col. 6, lines 51-59). Hence, recording of marks or spaces amongst different types of recording format can be achieved.

11. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno (US 5,150,351) in view of Furumiya et al. (US 5,490,126; hereafter Furumiya).

Regarding claim 20:

Ohno discloses an information storage medium which stores data recorded using a waveform, comprising:

a first state corresponding to a recording pattern of the waveform (see Fig. 4(a), first state is when the waveform is a high state); and

a second state corresponding to an erase pattern of the waveform (see Fig. 4(a), second state is when the waveform is a low state), wherein:

the erase pattern comprises a multi-pulse having a power level of an leading pulse of the erase pattern at a low power level of the multi-pulse (see Fig. 4(a) and 4(b); power  $P_r$  is the low power level of the multi-pulse), and the recording pattern and the erase pattern are concatenated by a cooling pulse of the waveform (see Fig. 4(b)).

Ohno fails to disclose a period between an end point of the erase pattern and a start point of the recording; however, Furumiya discloses an optical recording medium, wherein a power level of the leading pulse of the erase pattern is equal to a power level between an end of the erase pattern and a start point of a leading pulse of the recording pattern (see Fig. 1(b); most importantly, Furumiya teaches that the start point of a leading pulse of the recording pattern can be delayed).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the information storage medium of Ohno, so that the waveform includes a delay at the start point of the recording pulse, thereby resulting the power level of the leading pulse of the erase pattern to be equal to the power level of a period between the end point of the erase pattern and the start point of the recording pattern as taught by Furumiya. One of ordinary

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skill in the art would have been motivated to do this, because the occurrence of the edge shift caused by thermal interference across a shorter space in recording, thermal nonlinearity of a short mark, and the equalization characteristics during recording can be compensated for (see col. 2, line 65 to col. 3, line 2).

*Allowable Subject Matter*

12. Claims 3, 6 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In regards to claim 3, none of the reference of record alone or in combination disclose or suggest a cooling pulse has a power level below the low power level of the multi-pulse of the erase pattern.

In regards to claim 6, none of the reference of record alone or in combination disclose or suggest a waveform includes another recording pattern in which a power level of a period between a start of the another recording pattern and an end of another erase pattern preceding the another recording pattern is adjusted according to a pulse of the multi-pulse of the another erase pattern.

In regards to claim 17, none of the reference of record alone or in combination disclose or suggest a cooling pulse has a cooling power less than a power of a last pulse of the another multi-pulse of the recording pattern and less than the low power level of the leading pulse of the multi-pulse of the erase pattern.

***Response to Arguments***

13. Applicants' arguments with respect to claims 1-3, 6, 7, 9, 10, 12-18 and 20 have been considered but are moot in view of the new ground(s) of rejection.

Applicants' argument with respect to claim 19 is not persuasive. Namely, applicants argue the first one of the recording pulses shown in Fig. 1B has a level  $P_c$  which is below the power level  $P_{c1}$ ; therefore power level  $P_c$  is not the high power level  $P_{c1}$ . However, applicants must consider that Ichihara also teaches the waveform other than the one shown in the figure. Ichihara suggests that the power level of a period between the end point of the erase pattern and the start point of the recording pattern is at a high power level  $P_{c1}$  (see col. 6, line 62 to col. 7, line 1). Accordingly, claim 19 is not patentable over Ichihara.

***Conclusion***

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lixi Chow whose telephone number is 571-272-7571. The examiner can normally be reached on Mon-Fri, 8:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LC 1/5/07



WAYNE YOUNG  
SUPERVISORY PATENT EXAMINER